

# Lean in National Highways

## Road Investment Strategy Period 2 2020-2025



# Foreword



The impact of the National Highways Lean programme can truly be seen as industry changing.

I'm proud to say that practices such as Collaborative Planning, Lean Improvement interventions and Visual Management have become standard practice on our Major Project schemes and across our maintenance and operations programmes, helping to save time, reduce costs, minimise defects, improve health and safety and drive customer satisfaction.

The HELMA (Highways Excellence Lean Maturity Assessment) approach continues to be a cornerstone of our Lean strategy, supporting our supply chain partners by providing a clear routeway for embedding continuous improvement within their organisations. This has led to a significant and measurable impact.

Through Road Period 1 (2015-2020), £291 million of capital efficiencies have been realised through the adoption of Lean techniques – a remarkable outcome.

As we move into Road Period 2 (2020-2025), the need for Lean is only increasing. The deployment of the Alliance model in Smart Motorways and the Integrated Product Delivery models in Major Projects, as well as significant change programmes such as OE2025, Fit for the Future and HE 2025, all rely on a Lean Continuous Improvement ethos for their success.

Our increasing use of Lean thinking in-house will help us work successfully across functions to establish new, Lean end-to-end processes and ways of working whilst increasing employee engagement, all contributing to our culture of continuous improvement. This document sets out how Lean will continue to firmly establish itself as a key enabler to the achievement of broader National Highways aims.

**Mike Wilson**

Chief Highways Engineer

# How Lean supports

Our Strategic Business Plan cites Lean as a proven management technique that National Highways will use to deliver a reliable and resilient network. For example, the maintenance programme is “the first priority for available resources in RIS 2. We will use Lean techniques, coupled with the most effective technologies available, to make best use of these resources.”

In Road Period 1 (2015-2020) we achieved c.£300m of assured capital efficiencies through the use of Lean techniques. To build on the progress we have made, we have set ourselves a series of challenging objectives for this new Road Period, including our new Lean efficiency contribution.

By the end of Road Period 2 (end March 2025), National Highways must meet its Efficiency KPI of £2.23bn.

Lean, which has been identified as one of the main efficiency levers, will contribute at least £350m (approximately one sixth) of this amount. This will be within the efficiency categories of embedded efficiencies (delivery completed in Road Period 2 within reduced, post-efficient funding), measured efficiencies (where benefits are expected in Road Period 3) and carry over efficiencies from Road Period 1.

## Our ambition is that through Road Period 2 (2020 to 2025) we will:

- contribute £350m to the Road Period 2 efficiency programme using Lean techniques
- establish and sustain a continuous improvement ethos throughout National Highways
- continue to support the supply chain, holding it to account in its adoption of Lean practices
- maintain best practice standards in the way Lean is used throughout National Highways and its supply chain

This means that we will continue to work with our delivery focused directorates and supply chain, helping operations, maintenance activities, capital renewal and enhancement schemes to be undertaken efficiently and effectively.

In addition, we will continue to demonstrate National Highways' own commitment to Lean by building on the progress made in Road Period 1 to establish a continuous improvement ethos throughout corporate processes, teams and ways of working.

*“Collaborative Planning has been encouraged throughout the project. Cultures have changed from ‘old school’ ways of working and planning, to the behaviour being natural and supported at all levels.”*

*Nicole Preston, Operational Excellence Director, A14 Integrated Delivery Team*

### Case Study: The A14

The A14 Cambridge to Huntingdon scheme is a £1.5bn Complex Infrastructure Project that was delivered more than six months early (with one stretch open a year early), and on budget.

Lean was a fundamental part of this success. Widespread adoption of Collaborative Planning linked with tactical problem solving meant that the plan and critical path could be protected. People were upskilled and taught how to look for Lean efficiencies and instilled with an ethos of actively seeking continuous improvements. Targeted Lean interventions and projects drove efficiencies in both cost and time. An example Lean intervention helped construction to start earlier than planned by helping to identify how archaeologists' time could be freed up to carry out their work more quickly, leading to direct savings worth £1.5m.

Another Lean intervention contributed to onsite safety by reducing service strikes by 89%.



# What we do

In order to fulfil our ambition for Road Period 2 we will focus on the set of discrete delivery and support mechanisms illustrated and described here.

These are designed and configured to ensure Lean best practice is embedded in our approach and we have the right tools available to support the complete Lean Enterprise.

We will operate on a strict set of disciplines and processes so that only activities that will help achieve our Road Period 2 ambition will be supported.

Implementation of Performance Cells	Lean Improvement Projects	Lean Deployment Management
Facilitation of Knowledge Transfer	Build Lean Capability and Competence	Undertake Lean Research and Development
Provide Lean Support for the Sector and Supply Chain	Provide Expert Consulting	Undertake HELMA, SLCA and CP assessments



## Implementation of Performance Cells

- Provides the structure behind team-based continuous improvement
- Uses visual management to measure and display team performance
- Tracks improvements in team and employee engagement



## Lean Improvement Projects

- Support specific improvement projects on construction schemes and maintenance contracts
- Help to drive improvements in delivery of core, common activities where benefits can be leveraged on multiple applications (e.g. central barriers; structures; pavement etc.)
- Facilitate internal end to end process improvement projects along core value streams (e.g. Procure to Pay and Hire to Retire processes)



## Lean Deployment Management

- Lean benefit tracking
- Resource planning and management of Lean specialist capacity
- Management and maintenance of core processes (e.g. Lean activity and opportunity pipeline); Management of external Lean specialists and subject matter experts



## Facilitation of Knowledge Transfer

- Management and administration of the National Highways Lean SharePoint site
- Maintenance and administration of the Lean Tracker. Hold and distribute knowledge and best practice (e.g. via Knowledge Transfer Packs)

### Case Study: FBS Financial Control Transactions Team

National Highways' Finance team was introduced to Lean principles and techniques in late 2018. Within 9 months, team members had achieved a **200 hour reduction** in the overall processing time of cheques and, among other activities, eliminated the backlog of 700 unpaid invoices.

An **80% reduction in lead time** was achieved in other key processes (such as banking Green Claims cheques) with **levels of rework falling by over 20%**.

One of the most impactful outcomes has been significant increases in employee and team engagement over the same period.



# What we do



## Build Lean Capability and Competence

- Ownership and upkeep of Lean training standards, core training materials, Lean Capability route map and core skill capability standards
- Provide targeted delivery of Lean training to those requiring support with Lean projects & programmes
- Drive increased understanding, engagement and ownership at senior levels using Lean Leadership coaching



## Undertake Lean Research and Development

- Ensure knowledge of best practice in Lean and Lean construction by engaging with universities, research establishments and industry experts
- Target research and development on opportunities with a clear set of outcomes with a direct link to achievement of our RIS2 ambition
- Align Lean activities to broader developments across the industry (e.g. digital construction)



## Provide Lean Support to the Sector and Supply Chain

- Provide targeted support into the supply chain where there is a clear and tangible benefit that links to broader strategic aims and Lean RIS2 ambition
- Work with and support industry representative bodies (e.g. Lean Construction Institute UK) where there is a clear link to advancing the Lean agenda across the National Highways Lean Enterprise
- Drive a standardised approach to core Lean methodologies across National Highways supply chain activities (e.g. Collaborative Planning)



## Provide Expert Consulting

Provide direct support for core transformational projects to further the Lean agenda (e.g. SES Fit for the Future; OE2025; Process Simplification etc.)



- **Undertake Lean Maturity assessments:** Highways Excellence Lean Maturity Assessment (HELMA) for organisations, Simplified Lean Capability Assessment (SLCA) and Collaborative Planning (CP) Assessments on projects
- Maintain and continuously improve standard operating procedures for HELMA, SLCA and CP maturity assessments
- Continue to undertake assessments aimed at developing supply chain Lean maturity at both corporate and scheme level
- Adapt the HELMA approach to enable Lean maturity assessment internally within National Highways

### Case Study: M5 Oldbury Viaduct

On M5 Oldbury Viaduct a Lean project saved £6.2m by removing waste from the daily routine of site workers.

To minimise travel time the project built 3 satellite offices and supplied minibuses to transport workers. This freed up 85 minutes a day of productive time, increasing productivity from 62% to 78%. It also improved wellbeing on site as the new offices contained welfare facilities.

*“Highways England are showing what a Lean construction client should look like ... More construction client leaders need to follow this example.”*

*Claus Nesensohn, Professor for Lean Construction, University of Applied Sciences, Stuttgart, Germany*

# The role of the supply chain

To support the Road Investment Strategy 2 Plan and the Lean efficiency contribution, and our imperatives of safety, customer and delivery, our supply chain companies must continue in their commitment to using Lean, as is defined in our contracts.

Using our longstanding organisational Lean maturity assessment, we will continue to provide guidance to our supply chain.

We expect our suppliers to be learning organisations which keep improving the services they provide because of their continued application of Lean. This culture of being inquisitive and willing to try new working methods must be championed and modelled by business leaders and there should be overarching frameworks that ensure a coordinated and learning focused approach.

There must also be a collaborative team approach, where organisational differences do not form a barrier to delivery or learning from each other's experiences. At the highest level this means a seamless delivery of value across organisations through to our end customers.

We foster networks of best practice, and in particular, our National Highways Lean Community, to ensure we are sharing and learning as an industry and raising our collective performance in Lean.



## Case Study: National Highways Lean Community

The National Highways Lean Community is made up of Lean professionals, champions and enthusiasts. By the end of Road Period 1 the community had grown to 400 members, with the majority being from the supply chain who are responsible for driving and championing Lean activity within their organisations. Networking and knowledge sharing events, both in person and online have spread understanding of new developments and applications of Lean.

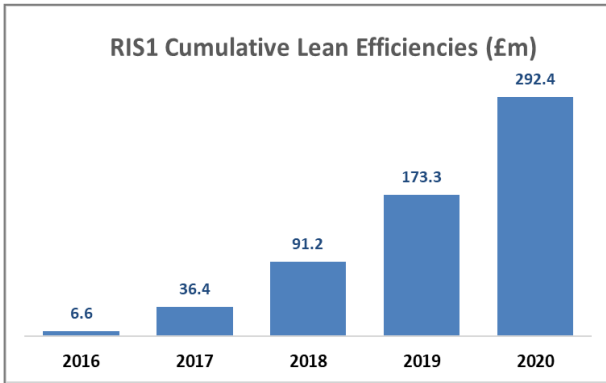
## Case Study: Area 9 Maintenance Depots

Area 9 improved safety and efficiency throughout its maintenance depots by using a Lean tool called 5S. The 5S are sort, straighten, sweep, system and sustain, these being the phases through which a workplace can be organised. Area 9 applied the 5S to organise stock so that it would be easily accessible, reducing vehicle movements and completely eliminating vehicle reversals within the depots.



# How we measure success

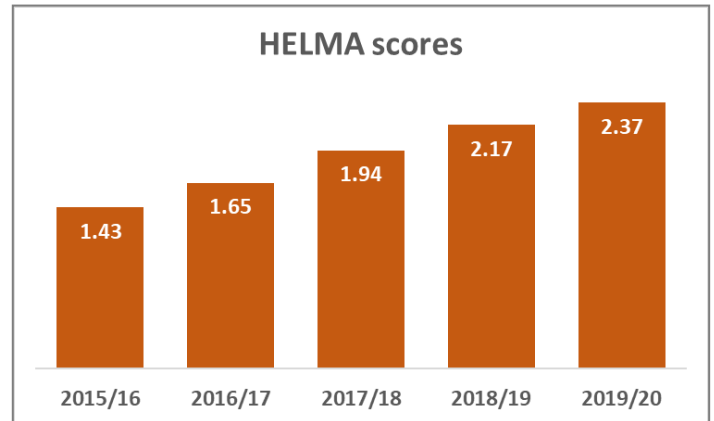
We measure and capture the benefits achieved using our Benefits Realisation Capture Process which has been assured by National Highways Central Efficiency Group (CEG).



During the five-year period 2015 to 2020 we achieved £291m capital efficiencies attributed to the use of Lean techniques, outperforming our £250m target by over 16%. For 2020 to 2025, The Lean Team has a new target contribution of £350m toward the Road Period 2 efficiency target of £2.23bn.

We also target and capture Lean improvements in:

- Safety
- Staff Lean engagement
- Sustainability
- Quality (reduction in errors)
- Time (reduction in process time)
- Supply Chain Lean Maturity (HELMA)



## The Lean Tracker

National Highways' Lean Project tracker has been in use since 2010. It is a searchable database of Lean projects on construction, maintenance and design processes within Highways England. The project case studies are provided by National Highways staff and members of its supply chain, with 40 organisations contributing in total.

It is a rich database where those looking for improvement ideas in any area can see what has already been done and apply this learning for themselves.

The tracker is publicly available, meaning that not only can anyone working for or on behalf of National Highways use its knowledge, but also other similar bodies in the UK, and even in other parts of the world, especially in the rest of Europe and the US, where National Highways' Lean clientship is seen as an example to learn from.

*"The Lean progress of Highways England is impressive in comparison to highway agencies in the United States. The shift from 'public service' to 'customer service' is notable and commendable. I look forward to seeing others adopt this model."*

*David Umstot, Author of Lean Project Delivery | Building Championship Project Teams*

# History and context

National Highways' Lean Team was established in April 2009. Initial focus concentrated on demonstrating the cost-saving potential of Lean and then creating a foundation of sufficient ideas and people to generate momentum. At first, activity was concentrated on supply chain areas before being introduced internally within our organisation in 2012.

Auditable savings of ~ £100 million at a return on investment of circa 25:1 were achieved between 2010 and 2015. A range of core tools was also developed which helped cement Lean thinking throughout the Supply Chain. This includes HELMA (Highways Excellence Lean Maturity Assessment), which has been used to assess suppliers at an organisational level since 2011, and has been critical to our success.

Throughout Road Period 1 2015-2020, Lean became more deeply embedded throughout the supply chain and used more widely within National Highways itself. The Lean approach is becoming core to broader success, as is evidenced by the fact that the target of £250m capital efficiencies raised through Lean activity was exceeded in that period.

The move into the Road Period 2 2020-2025 provides a new set of challenges and targets. By 2025, we will have delivered £350m of efficiencies using Lean tools and techniques, and Lean's reputation as a key enabler to the delivery of wider strategic aims will become embedded.



## Contacts and Further Information

Please contact [leanimprovement@highwaysengland.co.uk](mailto:leanimprovement@highwaysengland.co.uk) if you have inquiries about Lean in National Highways or would like to get in touch with the Lean Group.

Please visit our [Lean in National Highways SharePoint site](#) if you would like to learn more about what we do.